Ontario
fish and wildlife
Review

Vol. 17, No. 4, 1978

Attention: moose watchers. Dave Fraser and Milan Novak tell us a great deal about the behavior of moose.

Moose love sun in winter and salt in spring, and the perfect place to see them is Sibley Provincial Park.

Dave explains how to get close enough to a moose to take a good photograph.

Milan tells us how moose use cover, travel lanes and new logging cuts.

Carsten Jorgensen has another Fishing for Flavor, his tenth in the series. Good for us.

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The goal of the Ministry of Natural Resources is to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario, and to administer, protect and conserve public lands and waters.

Ontario

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EDITORIAL

Managing moose country

Managing moose habitat is a tough business. There are no easy solutions but three answers are clear.

First, we need the co-operation of the forest industry. Only when forest management is integrated with wildlife management can we hope to have substantial impact on large tracts of moose range. Many foresters are already willing to help, but wildlife managers must know exactly what they want and how the costs and benefits will add up.

Second, we need to integrate the management of different species of wildlife. Retaining cover patches, managing aquatic habitats, and supplying mineral supplements and fertilizers will make much more sense if it benefits a wide variety of species which humans find interesting.

Third, and basic to all our management, we must understand how the ecological system works. Milan Novak's article in this issue shows what one sharp-eyed biologist noticed about forest areas used by moose in mid-winter, but we need to know much, much more and we need to base our findings on carefully designed studies.

While most logged areas provide abundant browse, moose seem particularly drawn to openings created by fire. This may be a result of nutrient cycling caused by burning, but we don't really understand it. In some winters moose make heavy use of browse in large, open cut-overs, but in other years they seem to avoid these gigantic mess halls. Why? Could we produce more predictable use of cut-overs by different management?

In late winter, moose generally move to heavier forest cover, often among mature coniferous trees, but do they need patches of food within easy access of the mature forest? How crucial are aquatic feeding areas and mineral licks? What habitat favors survival of newborn calves? How much does the moose's health in winter depend on the actual winter food and how much depends on fat reserves gained from summer feeding? Why does Sweden have so many more moose in a smaller area?

In moose country, where ecological relationships are so poorly understood, a large chunk of our money and brain-power should be used on research to gain the knowledge on which all our management must depend.

INTROSPECT

A personal opinion
not necessarily endorsed by
the Ministry of Natural Resources

Fishing Derbies—Commercial Angling

by A. A. Wainio
Extension Biologist, Fisheries Branch

"Step right up folks. Buy a ticket and win a prize. Catch the biggest fish and win the jackpot."

Fishing derbies, big and small, have been held for decades in Ontario. In its day the lake trout supported large derbies in many communities along the shores of Lake Huron and Lake Superior. These gala social events were much like harvest festivals; the anglers gathered together, sailed out to harvest a crop and returned with their catches to celebrate and feast.

But now many derbies seem to have become commercial; they promote commercial products and offer extravagant prizes. The fish, be it yellow pickerel (walleye) or salmon, is not the prize but merely a means to an end. Fishing derbies seem to be evolving into a form of commercial fishing.

In Ontario, a yearly circuit of fishing derbies or tournaments (the new euphemism), is beginning to spread across the province. It seems that you aren't supposed to fish for fun, relaxation or food but for glory and cash.

Will future anglers be mainly motivated by the urge to catch the biggest fish and win cash awards? Recently in a muskie derby on Lake St. Clair, an angler was observed dangling ten lines out of his boat. In other waters anglers have been known to set many lines overnight in their quest for prize fish; some even set nets. Contests can contribute to illegal fishing.

Can you imagine what would happen to our wildlife populations if big cash awards were offered for the largest deer, moose or jack rabbit shot. Poaching would run rampant.

Contests are not illegal provided the anglers abide by the season, limits and other regulations in effect. Fishing derbies do not have to be registered with the Ministry of Natural Resources as some people believe.

In the Great Lakes recently it is the Pacific salmon that have spawned many of the "big fish contests." The salmon program in Lake Ontario is dependent solely on hatchery stock and so fishing for coho and chinook with the latest electronic gadgetry should not seriously affect other fish populations. But the fish derbies are spreading to inland lakes where the rich abundance of pickerel, bass, muskie and pike could suffer. Perhaps fishing derbies should be restricted to selected fish populations in selected lakes.

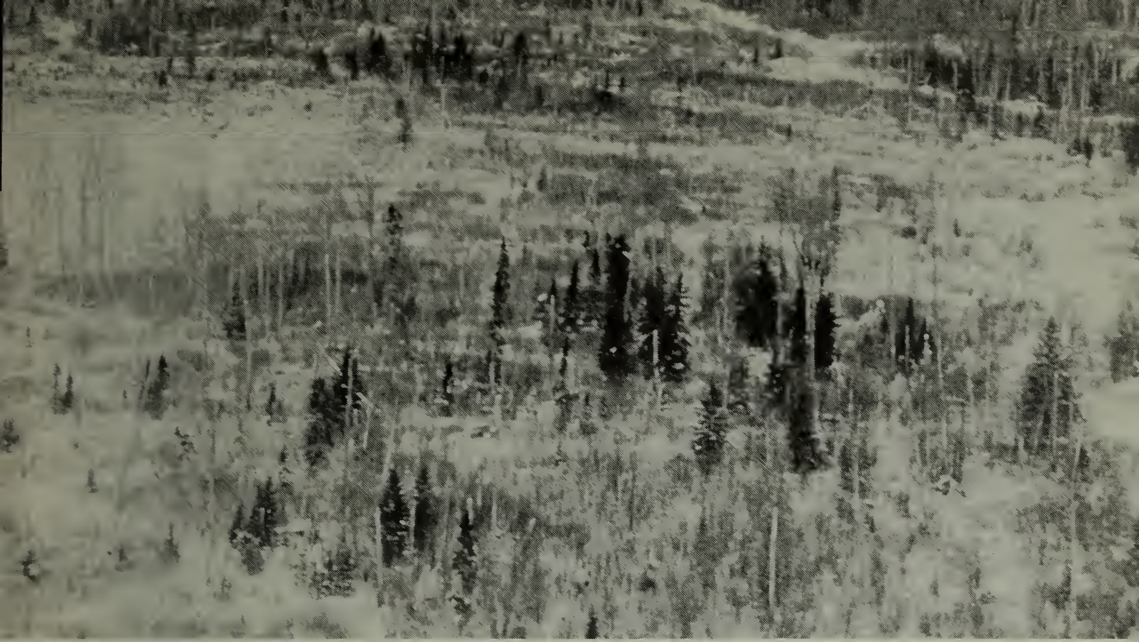
Strict rules govern some fish contests, but how well can they be enforced? There are so many opportunities for devious and illegal actions that derby organizers are always worried about cheaters and the reputation of the contest. For example there are usually some who catch large fish before the opening day of a derby and freeze their catch until the contest is open.

There is, however, one good thing to be said about big fish contests. They have given fishing the wide publicity it deserves. Fishing in Ontario bolsters the economy far more than most people realize. Anglers spent $600 million in Ontario last year.

But to promote the catching of fish at the expense of the art of angling is questionable. It has already resulted in a backlash from the public. In 1978 protesters threatened to disrupt a walleye tournament at Bobcaygeon. Derbies on inland waters got so out of hand in the State of Michigan that State officials were seriously considering banning them.

Commercial competitiveness is alien to the art of angling. The derby contestant is pitting himself against other men, not the fish. No longer does he concern himself with fishing finesse, enjoy a relaxed wait, or look forward to an unexpected big strike. Cultivating respect for the quarry has no place in a competition. All this is now overshadowed by the desire to catch a big fish.

The fish is now just a ticket in a lottery.
"And the winnah is—."



Good moose range, recently logged. The residual tree cover and regeneration of browse makes this a suitable habitat for adult moose and cows with calves.

Observations of moose in winter

Report and photos by M. Novak
Supervisor of Fur Management, Wildlife Branch

WHERE do moose *(Alces alces)* live in winter? Do they seek coniferous cover like white-tailed deer? Do the different social classes of moose select the same living sites?

These were some of the questions on my mind during two winters (1975 and 1976) of aerial surveys in northern Ontario. Because the surveys were conducted from helicopters, the observations were more detailed and in some respects more accurate than observations made from fixed-wing aircraft in earlier surveys.

It was concluded that the key elements of winter moose range, in order of importance, are as follows:

Protection from the wind
Exposure to the sun
Escape cover and isolation
  for cow-calf groups
Food
Good travel lanes.

Controlled logging is necessary for the establishment and maintenance of abundant game populations. However, we must understand the basic needs of moose before we can even attempt to suggest the techniques of forest management.

For example, we must be able to identify the critical components of moose living sites in winter before we can state which areas should not be cut, or where cutting or herbicidal application may be beneficial, not only to moose but to other wildlife.

Forest manipulation in the future, solely for the production of one species such as moose, is no more economically or morally justifiable than managing vast tracts of land to produce only jack pine or black spruce. Therefore, we must maximize the potential of a site to produce a variety of wildlife species ranging from red squirrels to ruffed grouse and black-capped chickadees.

To study the habitats and living requirements of moose, it is essential to examine the distribution by social classes. We must learn how to manage or manipulate the habitat to suit the most sensitive social class, the cow-calf group. The habitat requirements of this group would be suitable for dominant bulls whereas the reverse may not be true.

In conducting habitat requirement studies, it is necessary to relate the location of the animal observed from the air to its behavior. For example, a moose seen in black spruce or jack pine regeneration does not necessarily imply that the animal prefers and lives in that habitat type. Close examination may show that the animal was travelling between two preferred sites when seen. Moose travel considerable distances and unless the behavior of the animal is interpreted at the time of the observation, its use for a habitat analysis is limited.

Aerial photographs can be used most advantageously to study moose habitat use. The location of the moose or track aggregation can be marked exactly and related to vegetation and activities such as travelling, standing, feeding and sleeping. The observation time, wind, temperature and snow conditions can also be recorded.

In addition, the location of the cow-calf, solitary, group of two or more, and the sex and antler size of the animals can be related to the presence of roads, trails, lakes or streams, tree species, understory or shrub cover, shelter from the wind, exposure to sun, elevation, and proximity to other groups of moose. Subsequent ground tracking may provide further information.

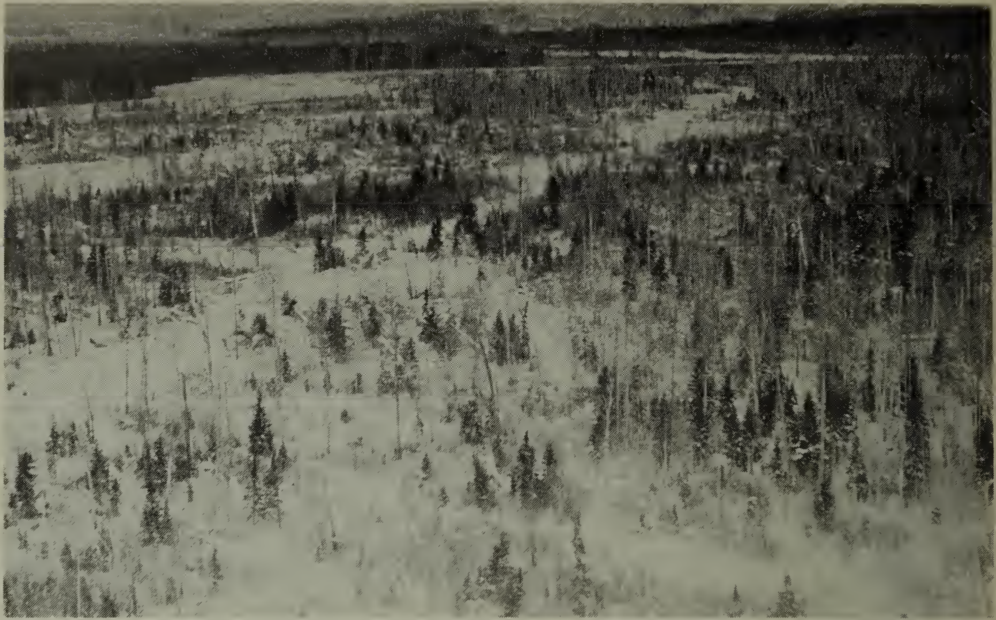
From observations made near Kapuskasing, it became evident that different social classes of moose used different areas of the range. Big bulls and dry cows tended to use more exposed sites and were often found high on the larger hills and ridges or in the more open cutovers.

Cow-calf groups tended to live in heavier cover and did not aggregate with other moose. An exception to this was the occasional continuing bond between a cow and the previous year's calf. Frequently the cow-calf living sites were small, isolated knolls or rocky outcrops, or areas beside small or intermittent streams. Perhaps this dispersion and isolation is an adaption to protect the calf against wolf predation.

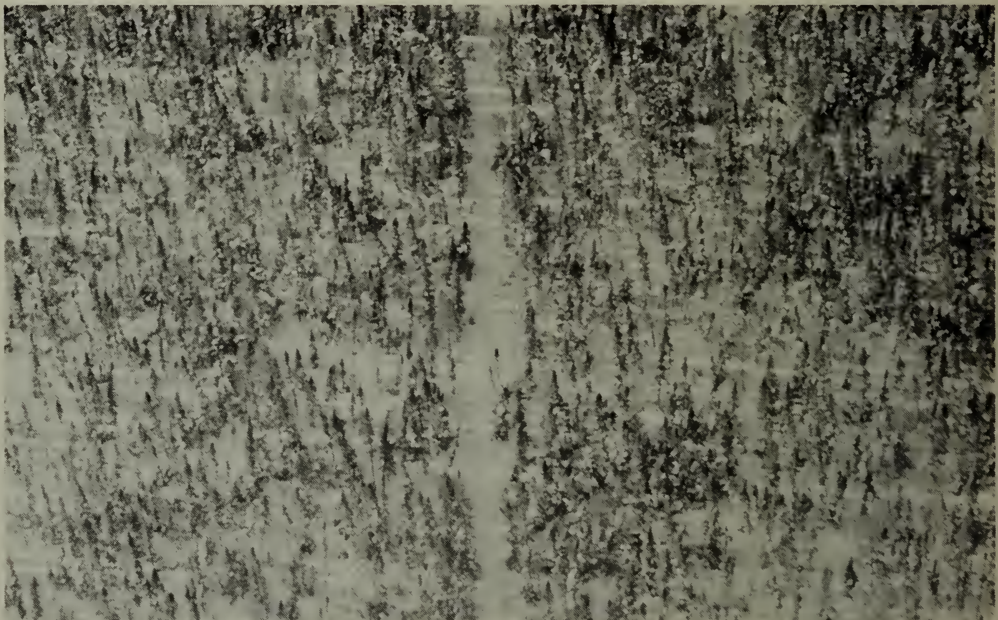
Cows with calves spend a considerable amount of time in pockets of habitat such as this in spite of the shortage of browse. The tall trees keep out the wind but the sun can penetrate early and late in the day. The conifers provide extra shelter from the wind and good escape cover, and the ground permits easy travelling.

An alder swale where a moose was bedded down in full sunlight before aroused by the noise from the helicopter. Such open swales, surrounded by thick mature forests, are used by moose as travel lanes and resting sites.

After an area is logged, the forester wants to see merchantable conifers as soon as possible. On large cutovers, this requires site preparation (such as scarifying with bulldozers), the planting of seedlings, and spraying to reduce early competition from deciduous species on which moose feed. This plantation is not good moose range.

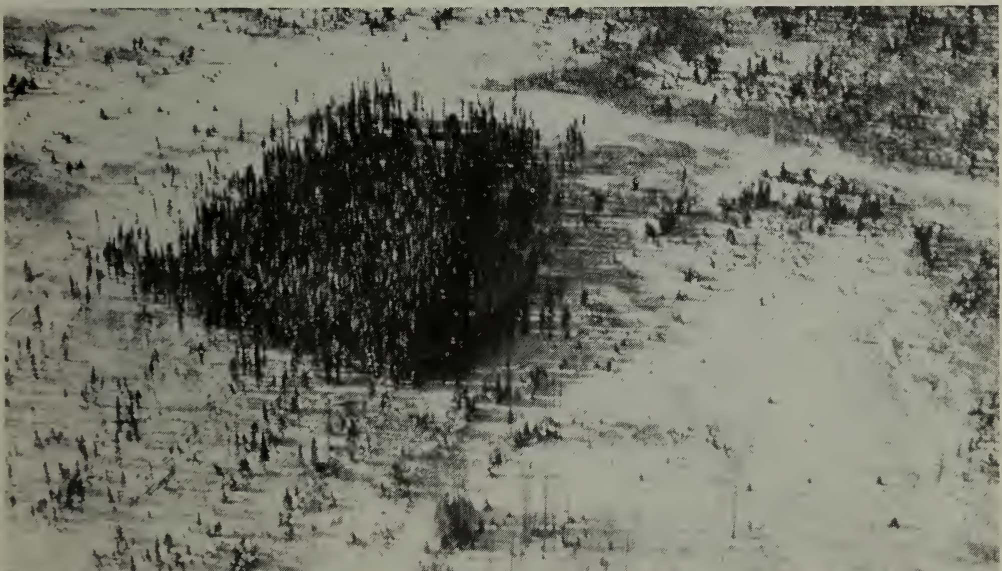


This excellent moose habitat is the result of logging a poplar-birch-spruce forest. The opening of the forest crown (which permits warming of the soil) and the mechanical damage caused by logging means that suckering and seed germination will produce an abundant and long-lasting food supply. This site meets the requirements for winter moose range and is suitable for cows with calves.



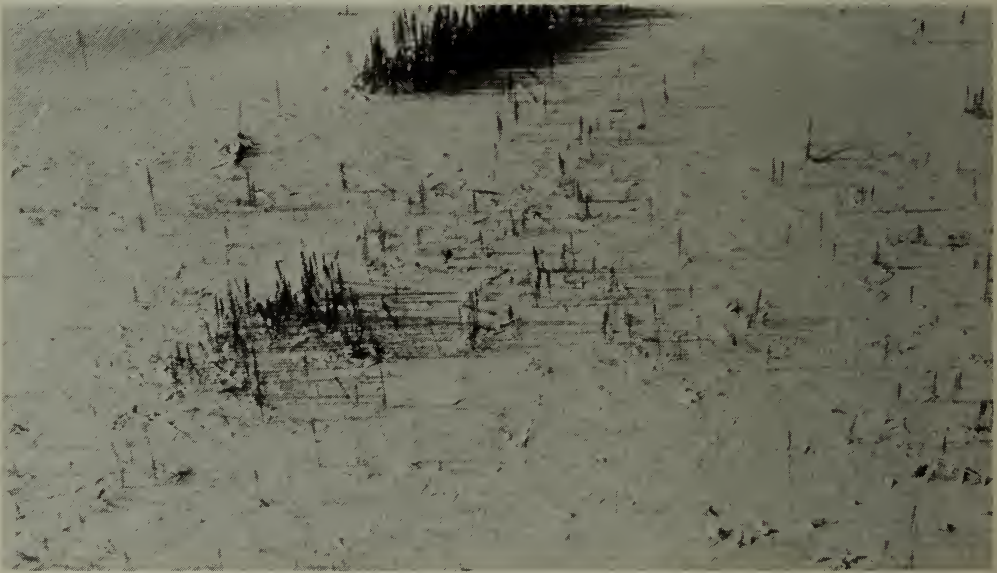
This site was an uninterrupted black spruce forest, but after logging the primary succession was to alder because the site became wetter after the trees were removed. The end product is an undesirable type of habitat for most wildlife and the loss of a productive forest to the forester. Old tracks on the abandoned logging road show that moose frequently pass through this site without stopping to rest or eat.

A bull moose stands contentedly in the warming rays of the winter sun—moose spend much time like this in winter. The umweldt *here has several good features—the small to medium spruce trees are well spaced; the tall poplars permit the sun to penetrate to the ground, even late in the afternoon when this picture was taken; the tall trees are a windbreak; the suckering trees provide some browse; and the walking is easy.*

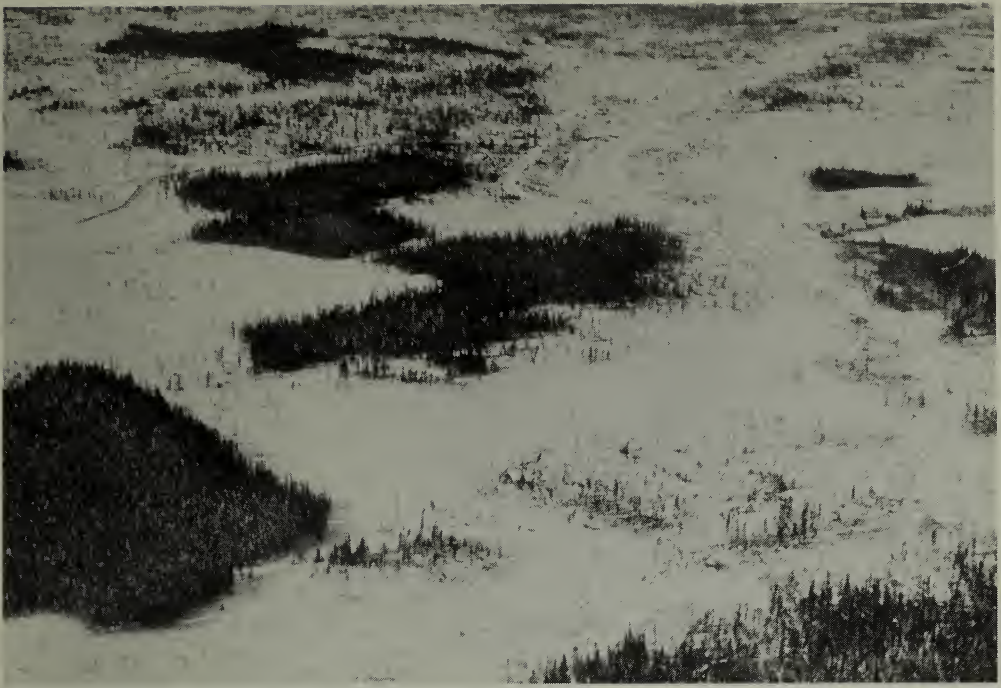


A logged-over spruce forest with a small reserve. Unfortunately, moose do not use such reserves in winter, and in the summer they prefer to live close to water. The reserve should have been left in the lower-right of the photograph where poplars are growing, with a belt of conifers left on the north and west sides to form a windbreak. This would result eventually in a desirable site for all wildlife.

We were not surprised to see the tracks of two moose crossing the creek (left of centre) and then to find a cow and calf. Moose need sites that permit uninterrupted sunning during winter days when temperatures can dip below—40°C and they also need sites that shelter them completely from the wind. The dense stands of spruce provide good escape cover from predators, and the small creek is a good travel lane. The cow and calf are isolated from hunters and wolves, both of which prefer to hunt over more open areas which have a denser population of other social classes of moose.



Clear cuts in the flat country of the north can become unsuitable for moose because they afford no protection from the cold, energy-depleting winds. Moose, particularly cows with calves, will shun such areas until the trees grow again.



A logged-over conifer forest with portions left to serve primarily as moose habitat. Our experience, however, indicates that moose dislike walking through dense spruce forest and will avoid such sites. It would have been better to cut the remnant patches and then manage the sites to produce deciduous shrubs and trees which could be logged when mature. Then, even if most of the area once again became a coniferous forest, the managed patches and connecting trails would be valuable habitat for moose, furbearers such as foxes and squirrels, rabbits, and many species of passerine, grouse and falconiformes.

This clear cut will become good moose range if the normal succession is allowed to take its course. It will be used first by strong, healthy adult moose and in a few years, when the trees grow larger, by cows with calves.

Two extreme habitat types—an uninterrupted black spruce forest and a clear cut. The wildlife manager can improve both habitats with pockets of poplars, of about one hectare each, in both areas, and connect them with trails. He should encourage foresters to cut patches in the coniferous forest to open it up to moose and other wildlife.

In managing habitat for moose, the game manager should strive to have pockets (such as above) left in a clear cut. This site has a good mix of poplar, birch, spruce and balsam fir, and there is much regenerating browse. The whole site was logged and the merchantable spruce removed. Continued logging of spruce in the future will ensure the usefulness of the site to many species of wildlife, including moose. Without logging, it will eventually become a solid stand of spruce.

A moose calf as it looks in spring and early summer.

Moose-watching in Sibley Provincial Park

by D. G. Fraser
Research Scientist, Wildlife Research Section, Wildlife Branch
Photos by H. Hristienko and G. Whitefield

AN enormous and powerful animal, solitary and independent by nature, living and moving in the northern forest according to a logic that no human really understands. . . . The mystique of the moose makes it one of the most challenging and rewarding subjects for naturalists, photographers and hunters in the northern bush.

Sibley Provincial Park, east of Thunder Bay, is a perfect location for moose-watching in Ontario. Protected from hunting and subjected to only moderate predation by wolves, the moose in Sibley are about as numerous as the food supply will allow. The Sibley moose seem more tame than most, perhaps because of their frequent exposure to human beings.

In typical years moose are most conspicuous between mid-May and mid-July. During this period moose are often seen on the roads in the early morning, evening and night, but a skillful observer can average several sightings per day by patient observation in the bush.

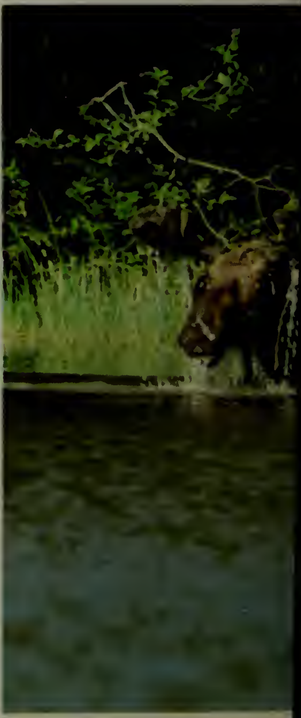
An important key to understanding the behavior of moose during this period is their need for the mineral nutrient, sodium. Human beings consume large quantities of sodium in the form of table salt (sodium chloride), but moose, deer and some other plant-eaters obtain only small quantities of sodium in their natural diets. These animals show a striking hunger for sodium in the spring and early summer. This draws moose

MOOSE IN SIBLE

Luis, photographed in Sibley for CBC's This Land.

Moose, munching a cattail,

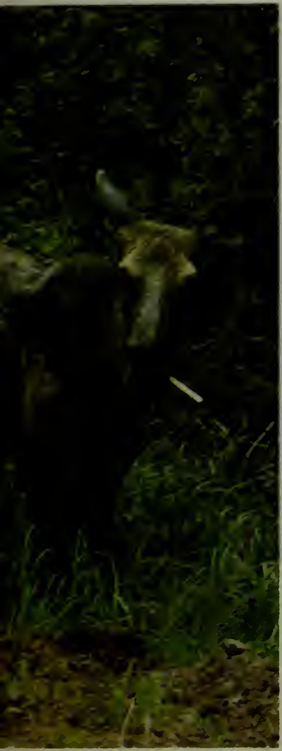
Moose at mineral lick in Sibley Provincial Park.



Moose feeding on aquatic

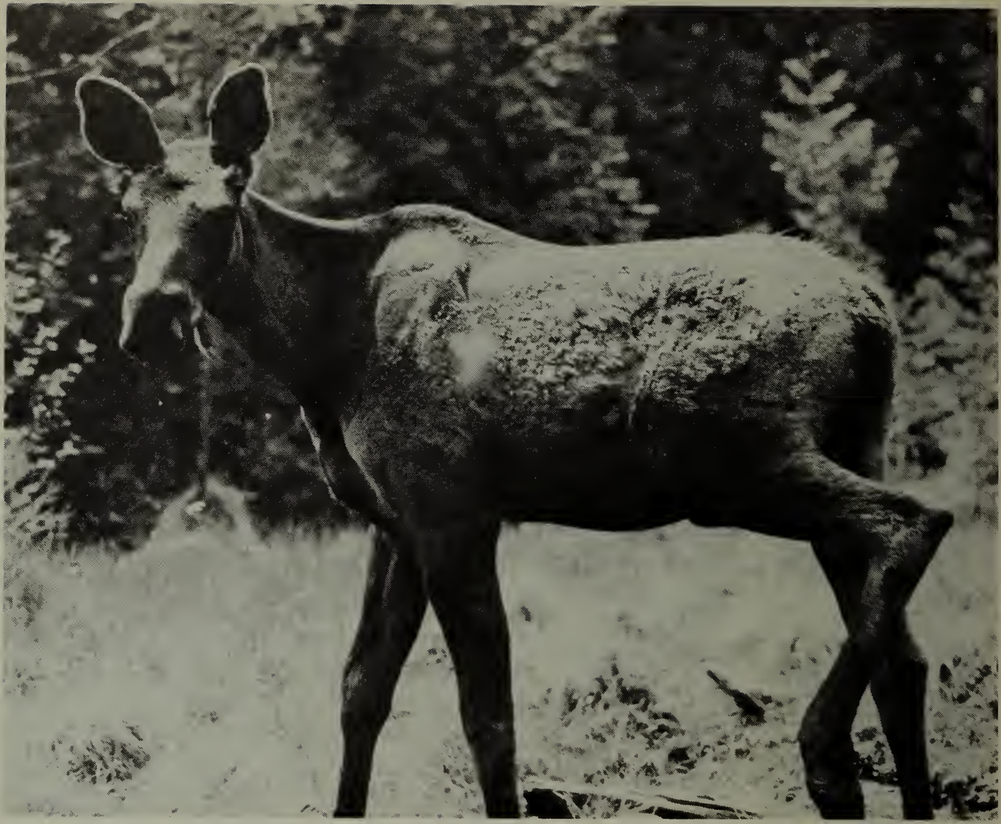
ROVINCIAL PARK

accumulation of road salt. Moose in mid-moult.—Photos by H. Hristienko



on.

Moose in sleek new summer coat.



A moose in its "woolly grey underwear."

to accumulations of road salt along highways and to natural mineral springs wherever they can be found. It may also account for the moose's unusual fondness for aquatic plants.

Natural mineral licks which attract wildlife are relatively common in some parts of the world but rare in most of northern Ontario except around Lake Nipigon, on the islands of Lake Superior, and in Sibley Park. Sibley has five known mineral licks. Three were mentioned in a 1931 geological report, and two others were discovered by a special search in 1977.

A typical mineral lick in Ontario is an area about the size of a large room with bare mud, small puddles of standing water, animal tracks galore, and well-developed animal trails leading in from different directions.

The Sibley licks are centred on slow-seeping natural springs whose water is rich in sodium chloride and other minerals. Although the spring water contains 50 to 100 times more sodium than the lakes and streams in the area, it is still far too dilute to be detected by human taste. For moose and deer, however, there is no mistaking the salty water, and the larger licks probably draw one or two dozen different moose plus numerous deer.

In late May and early June, a moose may visit a lick several times per day for a number of days, drinking several litres of water at each visit. Pools of urine, some of them bright red for reasons which are not fully understood, appear around the edge of the licks, and for a few weeks the area takes on the appearance of a barnyard. Use of the licks declines during June as aquatic feeding becomes common, and in July and August moose are not frequently seen at the licks.

The licks in Sibley are well removed from the roads and hiking trails and rather difficult to find. Even at the peak season, a person can sit for hours without seeing any animals except swarms of mosquitoes and black flies. But for the patient few who make the necessary preparations and are willing to wait, the licks provide an unusual opportu-

Moose are a traffic hazard, especially when they seek road salt in spring.

Henry Hristienko is not in danger; he had been assisting the moose which is ill.

nity to observe moose in the spring.

Aquatic plants are among the moose watcher's greatest allies. Moose show an enormous attraction to aquatic vegetation, particularly between mid-June and mid-July, although some feeding is seen as late as September and October. Certain lakes, certain parts of lakes, and certain stretches of river in Ontario are known as traditional aquatic feeding areas.

Not all lakes which boast a healthy growth of plants can be expected to attract moose. Aquatic plants differ in their nutritive value, apparently depending on the nature of the lake sediments and the chemical characteristics of the water. Since moose can apparently detect these differences, their use of an aquatic feeding area often differs from our expectations.

In Sibley Park, Joe Boy Lake is a traditional, well-used aquatic feeding area, and as many as 20 moose have been seen at one time in and around this small lake. In the late 1970s, however, activity in Joe Boy Lake has been less predictable than before. Gardner Lake and a number of small ponds in the park now provide some of the most favored aquatic feeding habitat.

By mid-July the moose's attraction to sodium has generally waned. The animals practically vanish from the roads and mineral springs, and aquatic feeding declines markedly. For the next two months (mid-July to mid-September), moose spend much of their time in areas where logging or other disturbance to the forest has produced an abundant regeneration of young trees and shrubs. Moose are difficult to see during this period, but bedding sites (areas of trampled plants where a moose has lain) are often found in open or logged areas.

The outward appearance of moose changes greatly during the spring and summer. In the spring a conspicuous moult puts the moose in a variety of unbecoming costumes. Some moose have large bald patches of solid black skin, particularly on the saddle area, where the winter coat has fallen out. Since moose hair is normally light grey at the root end, the bald patches are often bordered by a band of grey hair shafts. This can make a moose seem to be wearing a grey ribbon diagonally across its body, with the black tips of the winter hair showing behind and the black of bare skin to the front. For some animals, loss of the long hair exposes the fine, grey underhair of the winter coat. These moose appear to be running about in their woolly grey underwear.

But not all moose turn bald or grey in the spring. For some, particularly mature bulls, the new summer coat begins to grow beneath the winter coat and replaces it gradually without any loss of dignity.

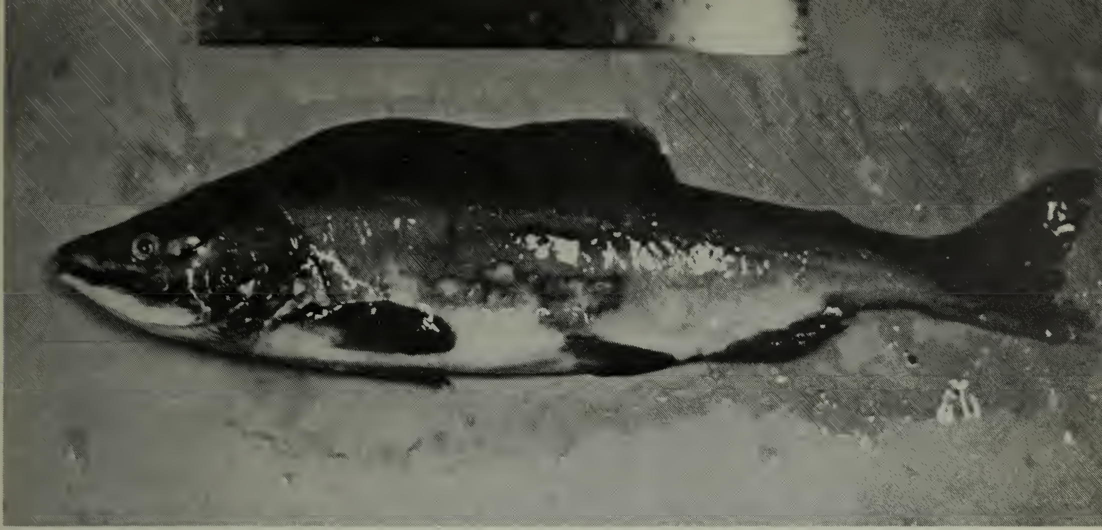
Moose calves change in appearance even more than the adults. About 14 to 16 kg (30 to 35 lbs.) at birth, the calf begins life in a tan-colored coat, unspotted except for large dark circles around the eyes. This coat is kept well into the summer. By late August the calf, now many times its birth weight, has a coat of greyish brown and a longer nose, and has generally begun to look more like a moose.

A Ministry of Natural Resources research project on moose has been in progress in Sibley Park since 1976. The work is designed to gain better insight into the behavior, habitat and nutritional requirements of moose during the important summer period when the calves get their start in life, and when the adults gain the nutritional resources to help them through the winter.

The research is paying close attention to sodium, partly because of its nutritional importance and partly to find a means of reducing highway accidents involving moose. The work is also addressing ways to manage aquatic feeding areas and create viewing opportunities in parks to allow the public to get better acquainted with the province's largest land mammal.

When approaching a moose in a canoe, one can make good use of the wind and sun. A moose cannot see well when looking toward the sun low on the horizon, and cannot smell an intruder downwind. A canoe which moves slowly with the sun behind and the wind in front can often approach close enough for excellent viewing or photographs.

A word of warning is in order. Although moose are generally placid and timid, they are capable of quick and aggressive action, especially in the autumn breeding season. Bears in some areas have lost their fear of human beings through repeated close exposure and may become dangerous. In the case of moose, we must not allow excessive familiarity to breed overconfidence.



A male humpback salmon at even-year spawning.—Photo by W. Kwain

Pink salmon are here to stay

by W. Kwain
Research Scientist, Lake Superior Fishery Research Unit

THE upper Great Lakes have the first and only self-sustaining population of freshwater pink salmon in the world. This has surprised many scientists who had always believed that the pink salmon was an obligatory anadromous fish that could grow to maturity only in oceanic waters. What did we do right?

It was an accident.

A small number of fingerling pink salmon *(Oncorhynchus gorbuscha)* originating in the Skeena River, British Colombia, were inadvertently introduced into Lake Superior in June, 1956, when the former Ontario Department of Lands and Forests was working on a salmon rearing program. The purpose was to establish a sport and commercial fishery for the native peoples of the Hudson Bay and James Bay areas, and almost all the pink salmon were planted the same year in Goose Creek, a tributary of Hudson Bay.

About 100 fingerlings escaped into Thunder Bay during the loading of an Otter floatplane. The hatchery manager later cleaned out some troughs and planted 350 pinks in the vicinity of Pie Island. After the Otter left for the north, 21,000 remaining pinks were discarded into a sewer that led to the Current River that flows into Lake Superior.

The next generation of pink salmon, which have a two-year life cycle, produced spawning adults in 1959. Two pink salmon were caught in the fall of 1959 by two anglers on Minnesota streams which flow into Lake Superior. One fish was caught by Willard J. Negard on September 11 at the mouth of the Cross River and the other by William A. Vancalberg on September 19 at the Sucker River. Both fish were male and measured 48.3 cm (19 inches) and 49.5 cm (19½ inches) respectively.

Two years later in 1961, three pink salmon were captured in Ontario waters of Lake Superior and are preserved in the Royal Ontario Museum. One specimen was caught by a commercial fisherman on September 3 in Black Bay. A second was caught in the Nipigon River on September 25, and the third was picked up at the mouth of Pigeon River on October 6. Four pink salmon were caught in the same year at the mouth of the

Poplar River, Minnesota, in mid-September.

The capture of mature pink salmon in these waters in September can certainly be accepted as proof that these fish were the third generation of pink salmon reaching maturity in Lake Superior. They were the second generation to reach maturity and spawn successfully in freshwater. These odd-year pink salmon were almost forgotten until 1969 when intensive spawning runs were reported in tributaries in Ontario, Michigan, Minnesota and Wisconsin.

For years, the pinks seemed to confine themselves to Lake Superior, but Lake Huron got its first look at this Pacific salmon in 1969 when a pink salmon (spent female) was collected in the Carp River, a tributary on the Upper Michigan Peninsula. The first pink salmon recorded in Ontario waters of Lake Huron was captured by a commercial fisherman on August 28, 1971, north of Bigsby Island in the North Channel of Lake Huron. In 1973 a male pink salmon was taken in commercial nets at Burnt Island and in September a female was caught by an angler in the Mindemoya River on the south shore of Manitoulin Island. Seven more pink salmon were observed near redds 1.7 km upstream from the mouth on October 2.

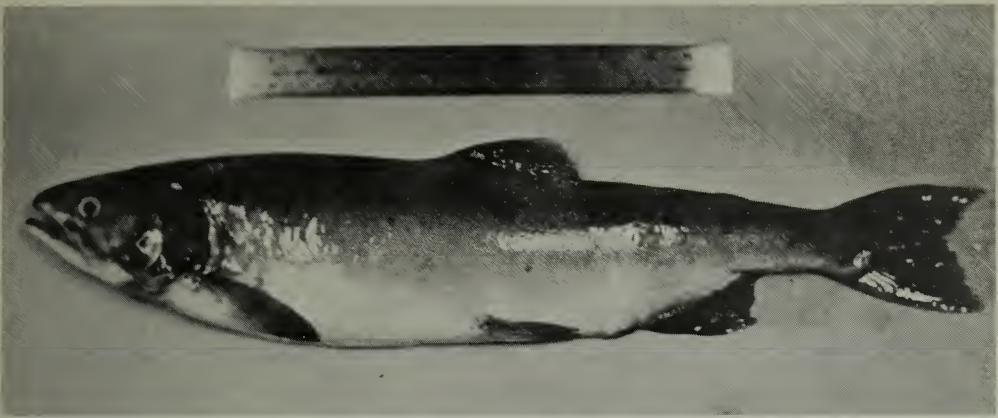
By 1975 the tenth generation of pink salmon was found in almost every tributary of Lake Superior in Ontario waters.

The major planting in Hudson Bay failed, or at least no return of adult fish had been noticed, and it was considered unlikely that the species would thrive in the cold and low-nutrient waters of Lake Superior. Apparently, however, pinks have overcome the physiological barriers and adapted readily to the lacustrine environment.

It is firmly believed that the pinks have come to stay in our waters and they are regarded as one of the established exotic species of the Great Lakes.

As this is the only existing freshwater pink

Dorion hatchery where pink fingerlings were raised—Photo by C. Van Gemenden



A female pink salmon at even-year spawning.—Photo by W. Kwain

salmon in the world the Lake Superior Fishery Research Unit of the Ministry of Natural Resources has undertaken a study of the physiological and behavioral characteristics of the species to provide scientific data for better management.

The pink salmon first appears in streams in the first week of September (odd years) and the peak of spawning occurs in mid-September. The water temperature and upsurging of the water level seems to be the cue for the pinks to move into the river. The run only lasts about three weeks. The fish push upstream to the first patch of suitable gravel and fan out a redd to deposit their eggs. One female is often attended by several males.

The spawning pinks are distinctly different from other salmon in appearance. Males develop a prominent bony hump on their backs just prior to spawning and this distinctive shape makes them easy to recognize in the river. No other fish looks like a humpback salmon.

Pink alevin, or fry with a large yolk-sac, remain in the gravel until the yolk is absorbed, usually by April or early May. Then they struggle up out of the nest and become free swimmers about 35 mm long and immediately move out into the river with the high water in the spring. Thus, they do not compete for habitat with other salmonid fishes in the river.

The color of a freshwater pink salmon during its "sea" life is fairly silvery below the lateral line and greenish blue on the upper portion. Their color will darken when they stay in the river. The upper surface of the fish is dotted with large oval-shaped spots which also cover the tail fin and both lobes of the forked tail. At spawning time the males have darker heads and backs, with sides a pale red with brown to olive-green blotches. Females tend to be slimmer than the male fish; they are covered with distinctly minute scales.

On September 24, 1976, a fish was taken by an angler in the Steel River and later identified by the Royal Ontario Museum as a pink salmon. Another two were caught on September 29, and on October 13, six more were collected. They were all spent females; some of them still had eggs inside their bodies.

This is the first evidence of an even-year spawning population of pink salmon in Ontario waters of Lake Superior. This shift in their spawning behavior can not be explained. In the future, we might have the opportunity to enjoy both odd and even-year pink salmon.

Pinks bite quite well with a proper presentation of lure or fly, and they fight extremely well for their size. Once a small school of fish is spotted, a small spinner or bright fly should be cast and allowed to swing in front of their noses to tease them into striking. Constant repetitious casting is often necessary to provoke a strike. The pink is an interesting fish, lovely to look at, and a great deal of fun to take with light tackle. Lucky anglers say they taste very good on the dinner table.

In view of their importance to the west coast fishery, both commercial and sport, the pink salmon may in time become an important fishery in Ontario.

LETTERS IN REVIEW

Readers of 'Review'
are invited to set forth
their views in these columns

Lake Nipigon brook trout

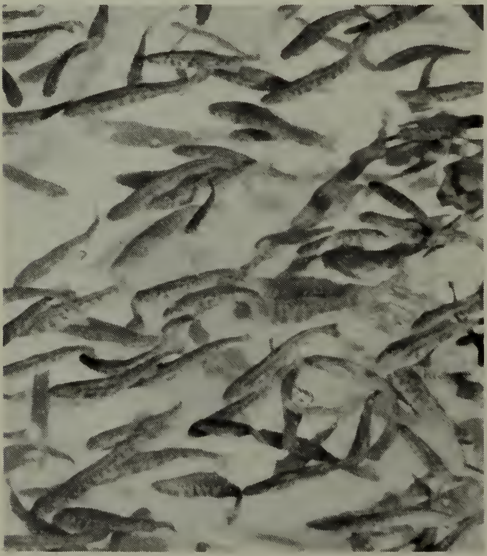
The Ministry of Natural Resources and other groups have created a salmon fishery in eastern Ontario. With the stocking of naturally reproducing species, the eastern angler can be optimistic about the fishing for the future.

I agree that the fish have told us what is wrong with our waterways and now it is up to us to do something about it.

Lake Nipigon has the potential to be the best trout lake in Ontario. If the Ministry can restore fishing in the Great Lakes, with problems such as lamprey and poor water quality to overcome, Lake Nipigon's potential can also be realized.

Fluctuating water levels and the silting of bays (due to timber harvesting) have drastically reduced the brook trout population in Lake Nipigon and lowered the levels of successful spawning.

In this age of dwindling energy, restoration of the lake to its natural state would not be possible. The hydro-electric dams must draw water from the lake to create the much needed power. With the continued changes in water levels, the native fish community cannot be built up or even maintained.



Brook trout fingerlings in a hatchery.

Each year there are fewer mature brook trout on the spawning beds, and one can easily see that the brook trout population will decline over a period of years to levels that may not be resurrected. We would lose a distinctive gene pool and the potential to produce a new world record.

I believe in the maintenance of a natural community in a balanced state wherever possible. However, where other valuable resources are involved and the balance is disturbed by man's interference, then it is up to society to restore the balance artificially.

The stripping of spawn and the raising of fry to fingerling size appears to be the only answer if the brook trout population in Lake Nipigon is to be rebuilt to its former levels before the 1960s.

I strongly support fish stocking programs to build and maintain fish communities in a balanced state. Lake Nipigon has been overlooked long enough. Let's give it a little help.

R. J. Swerdlyk
Thunder Bay, Ontario

Fish story

Once upon a time there was a brilliant sturgeon on the staff of the Community Health Fishility. In fact, he was one of its flounders. Wiser than salmon, a fin fellow, he would never shrimp from his responsibilities. In short, he was happy and successful and whistled a happy tuna.

Then one day, a patient, a mere whipper snapper, told the sturgeon that his medical theories were full of abolone. He trouted all over town, telling people that the sturgeon's treatments had made him more eel than before. Finally, he conched the sturgeon with a malpractice suit.

The sturgeon realized he was in a real pickerel. The board demanded his oyster and chased him off the staff. But the case smelt to high heaven and the judge denied the plaintiff's clam; whereupon the board tried to hire the sturgeon back. Alas, he had started hitting the bottlenose pretty hard and the end of our shad tale is that the sturgeon finally wound up on squid roe.

Buoy. Isn't that a fine kettle of you know what. (Name withheld by request)

The view from the Moose River check station.

A tradition on the Moose River

by D. G. Ferguson
Conservation Officer, Moosonee District

THE Moose River waterfowl check stations were established in 1957 to curb illegal hunting in the lower James Bay area. A camp was located at the mouth of each of the two main channels of the Moose River and hunters were required to stop and report their kill on their return up river to Moosonee or Moose Factory.

As enforcement problems diminished, the check stations were used more extensively to gather information on waterfowl and the hunt.

Each year hundreds of hunters travel to the coasts of James and Hudson Bays to experience some of the best goose hunting in North America. Hunter-kill data gathered at the check stations is combined with information from other sources and used by managers on the Mississippi and Atlantic flyways to set waterfowl seasons and bag limits.

Over the years the Moose River check stations have provided data for numbers of studies. Stomach contents of geese have been collected for goose food study projects. Goose weights have been taken and feathers collected for chemical analysis. Waterfowl bands have been collected and reported to the U.S. Fish and Wildlife Service who coordinate statistics from both the United States and Canada.

The check stations have been staffed in various ways. Ministry biologists and conservation officers are assisted by local Indians who are needed for their knowledge of the hunting areas and for translating the reports of local Cree guides and hunters. In recent years conservation officers from across the province have been invited to round out the team. This helps with manpower problems and also provides interesting northern experience for southern staff.

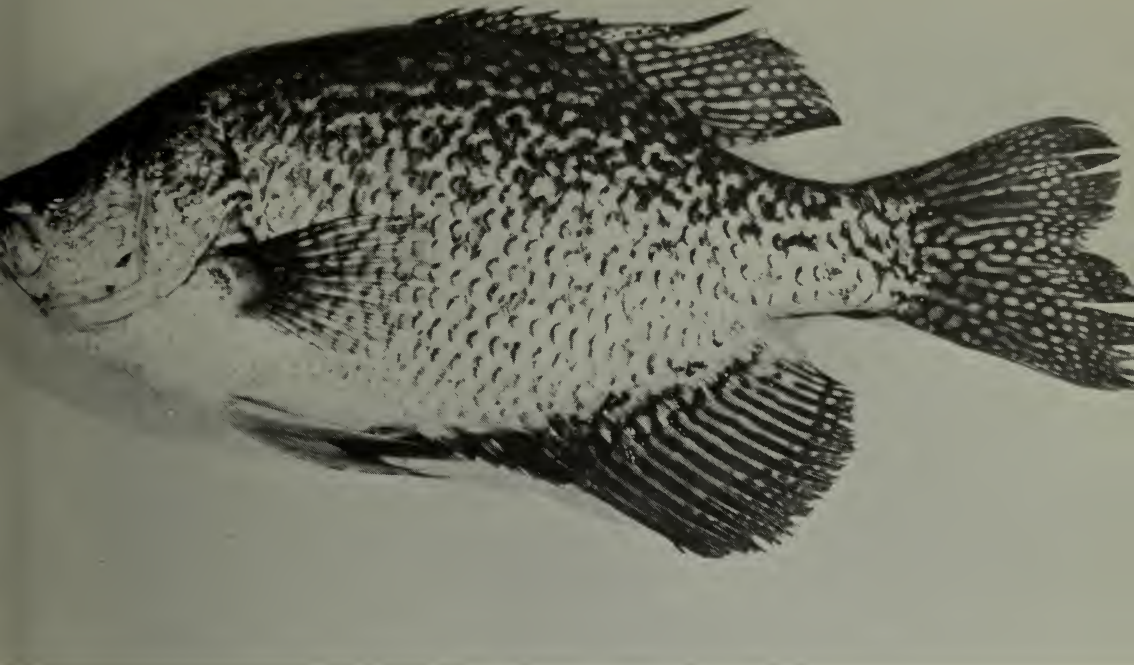
The check stations are busy from the opening day of hunting season until the geese leave in late October, usually about six weeks later. In 1977 more than 1,600 hunters were checked. Some 10,800 snow and

Collecting biological data at check station—Photo by R. Stitt

blue geese, 224 Canada geese and 1,603 ducks were recorded passing through the check stations.

Hunters have learned the check stations provide a haven from the elements. When caught out in storms or driven from their campsites by high tides, they can find refuge in the warmth of one of the check station cabins. Many hunters, while checking through, linger to chat while warming up over a hot cup of coffee. Occasionally people who are overdue returning home, usually because of bad weather, will request the check station staff to pass a radio message to Moosonee saying all is well.

It is service and hospitality like this that has gained our check stations the local acceptance that makes the project successful.



Fishing for flavor—black crappie

by C. R. Jorgensen
Biologist, Lake Nipissing Fisheries Assessment Unit

THE black crappie, *Pomoxis nigromaculatus,* is a large deep-bodied sunfish with extreme lateral compression. It is pale olive-green in color with silvery reflections; the sides and fins are mottled with pale green or black. A very prominent feature is the protruding mouth accentuated by the dented-in shape of the head just above the eye.

The black crappie is the largest panfish in Ontario and may reach a length of 35.6 cm (14 inches). The angling record is 2.23 kg, 48.9 cm.

Often called the calico bass, it occurs widely in Canadian waters, spawning in late spring and early summer. It builds a nest in from 1½ to 2 m of water on sandy or silted bottom among rooted aquatic plants.

The preferred habitat in summer and winter is clear, quiet waters of large ponds, small lakes, bays and shallow areas of large lakes. Most of the time crappies are found in moderately large schools where there are abundant growths of aquatic vegetation in sandy to mucky bottoms. Feeding is most active in the open water in the early morning, evening and night. Their food changes with size and age; the very young feed on plankton and fly larvae while the older crappies feed on small fish.

Some anglers believe that crappies prefer jigs to minnows. One efficient technique is called "poke" jigging. This consists of gently lowering the jig until it pokes the bottom and then raising it and repeating the action. All movement should be gentle to avoid snagging the fish.

The crappie is best as a pan fish, scaled, beheaded, gutted and pan fried. An excellent meal consists of black crappie dipped in egg, then in corn meal, and fried in sweet butter until crisp on the outside and moist on the inside.

Broiled Crappie Fillets

6 large crappie fillets
½ pound butter, melted

Juice of 6 limes
12 raw shrimp (peeled, deveined, minced)
freshly milled black pepper

Mix three-quarters of the butter, three-quarters of the lime juice and all of the minced shrimp and a liberal amount of pepper. Blend well. Place fish on charcoal broiler, spoon sauce over them and broil for 12 minutes, basting with lime-butter-shrimp sauce every minute. Sprinkle hot lime juice over hot plates, place cooked fish on them, brush with hot melted butter and lightly sprinkle with salt and black pepper.

Simple Crappies

12 crappies
3 cups fine cornmeal
½ pound unsalted butter
Juice of 2 lemons
1 tablespoon small capers

Wash crappies and roll in cornmeal. Melt two-thirds of the butter in fry-pan and cook fish on both sides until crusty brown. Keep warm. Melt the remaining butter and stir in the lemon juice with the capers. Before serving fish, remove crust; it will come off like a glove and with it the scales, leaving juicy white portions of fish. Pour the hot butter, lemon and capers over the fish and serve immediately. Serves six.

A string of crappies
—Photo by L. Whistance-Smith

Crappie Provencale

Here is a simple French method of cooking crappies. It is different and piquant.

4 crappies dressed, left whole.
1 teaspoon of salt
½ teaspoon of pepper
Juice of one lemon
½ cup of flour
3 tablespoons of butter
1 tablespoon of olive oil
2 tablespoons of butter
3 shallots, chopped
2 garlic cloves, minced
3 tomatoes, skinned, chopped, drained of juice.

Salt and pepper the fish, sprinkle well with lemon juice and roll them in the flour. Heat three tablespoons of butter and olive oil in a skillet and brown fish evenly on both sides over medium heat. Takes about 15 minutes. Place fish on warm serving platter. In another skillet melt the two tablespoons of butter and sauté shallots and garlic until soft; add tomatoes and cook ten minutes, stirring often. Spoon this mixture evenly over the fish. Serves four.

Crees take over goose camps

Cree Indians have taken possession of two of the seven goose hunting camps operated by the Ministry of Natural Resources near the shores of James and Hudson Bays. Local Cree residents worked in the camps and learned how to cater to hunters and guide them to excellent goose hunting. This was part of the Ministry's plan to help native people establish successful businesses. James Rickard took over the Tidewater camp, 64 km east of Moosonee, in 1976. Another Cree, Gabriel Spence, became owner of the Attawapiskat camp, 225 km north of Moosonee, in August, 1978. Five other goose hunting camps are operated by the Ministry near the Severn, Winisk, Kapiskau, Kashechewan and Albany Rivers. They are managed by Crees and will be turned over to the managers at later dates.

Sale of Crown cottage lots

Cottage lots on Crown lands may be purchased by Ontario residents. If the lots are not sold within one year, they may be purchased by Canadians from outside Ontario. If they are not sold within two years, they may be leased by visitors from other countries. For information on Crown lots, apply to the nearest district office of the Ministry of Natural Resources.

Where to clean fish

It is contrary to the Fisheries Act of Canada to deposit the remains of fish on the shore or in the water. If garbage cans are not provided at your fishing spot, take the fish home to clean.

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